

Creating a New Bioscience Research Infrastructure for Cost-Competitive, Carbon-Neutral Biofuels

A World of Microbes for DOE Missions Microbes are the foundation for life on earth.

DOE Office of Science genome research programs use DNA sequences of microbes to launch large-scale investigations

into the wide-ranging and complex biochemical abilities of these organisms. The knowledge gained can provide a

foundation for energy and environmental Biofuels solutions.

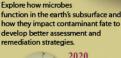
Understand microbes and their components to enable optimized systems for producing biofuels such as cellulosic ethanol and hydrogen.

Efficiently convert plant cellulose to



2050 Mobilize

biohydrogen-



Cleanup



Stabilization Determine how microbes impact carbon cycling in ocean and terrestrial ecosystems to develop better ways to assess global carbon sequestration strategies and climate impacts.

Climate

2040 Help stabilize atmospheric carbon dioxide to counter global

Payoffs for the Nation

Genomics:GTL Research Program

- Builds on the successes of the **DOE-initiated Human Genome Project**
- Scientific program and four planned user facilities will leverage DOE strengths in genomics, computing, technology development, and multidisciplinary teaming.
- The ultimate scientific goal is to develop a deep understanding of living microbes and their communities to provide the scientific foundation for industrial applications and public policy:
 - Applications technologies: Biofuels production and bioremediation technologies
 - Policy-support products: Climate and economic models to support assessments of energy and carbon-sequestration strategies.